

**(12) PATENT APPLICATION**  
**(19) AUSTRALIAN PATENT OFFICE**

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**Device for microwave heating**

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**A47J 036/02**

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**(71) Applicant(s)**  
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**(54) Inventor(s)**  
**Len A. Arnott; Lew H. Bernau; Randall J. Bonney**

↓ INSTRUCTIONS  
(a) If Convention  
application insert  
"Convention"  
(b) Delete one

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25 JUN 1987  
Melbourne

APPLICATION FOR A (b) STANDARD/BRIEF PATENT

(c) Insert FULL  
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I, We, PAK PACIFIC CORPORATION PTY. LTD.

(d) Insert FULL  
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of (a) Cnr. Dougharney & Sheehan Roads  
West Heidelberg, Victoria

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hereby apply for the grant of a (c) Standard ~~Brief~~ Patent for an invention entitled

(i) "APPARATUS FOR MICROWAVE HEATING"

which is described in the accompanying (e) provisional specification.

(Note: The following applies only to Convention applications)

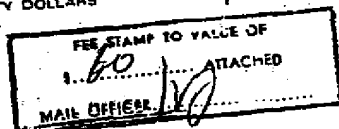
Details of basic application(s)

Application No.

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Filing Date

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Address for Service:

PHILLIPS ORMONDE AND FITZPATRICK  
Patent and Trade Mark Attorneys  
367 Collins Street  
Melbourne, Australia 3000

(i) Insert date  
of signing

Dated (i) 25 June 1987

(j) Signature of  
applicant(s)  
(For body  
corporate  
see headnote\*)

(k) Corporate seal  
if any

(k)

(j) PHILLIPS ORMONDE & FITZPATRICK  
Attorneys for:  
PAK PACIFIC CORPORATION PTY. LTD.

Note: No legalization  
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VM

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West Heidelberg, Victoria,  
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(f) Insert TITLE  
of invention

(f) DEVICE FOR MICROWAVE HEATING

(g) Insert "complete"  
or "provisional"  
or "petty patent"

which is described in the accompanying (g) complete specification.

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Details of basic application(s)

(h) Insert number,  
country and  
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the/or each  
basic application

(h)

Application No.	Country	Filing Date
(h)		

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of signing

M000533 22/06/88

Dated (i) 22 June, 1988.

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applicant(s)  
(For body  
corporate  
see headnote\*)

(k) Corporate seal  
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(k)

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DECLARATION FOR A PATENT APPLICATION

V INSTRUCTIONS

- (a) Insert "Convention"  
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In support of the (a) application made by  
(b) PAK PACIFIC CORPORATION PTY. LTD.

- (c) Insert "of addition"  
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(hereinafter called "applicant(s) for a patent (c)  
invention entitled (d) for an

DEVICE FOR MICROWAVE HEATING

- (e) Insert FULL name(s)  
AND address(es) of  
deklarant(s)  
(See headnote\*)

I/We (e) PAMELA GEDFREY, MGR. ACCOUNTING & ADMIN  
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do solemnly and sincerely declare as follows:

XXXXXXXXXXXXXXXXXXXXX

(or, in the case of an application by a body corporate)

1. I am/XXXXX authorized to make this declaration on behalf of the applicant(s).

XXXXXXXXXXXXXXXXXXXXX

(or, where the applicant(s) is/are not the actual inventor(s))

- (f) Insert FULL name(s)  
AND address(es) of  
actual inventor(s)

2. (f) Len A. ARNOTT, Lew H. BERNAU and Randall J. BONNEY,  
respectively of 3 Capricorn Avenue, Doncaster,  
22 Columbia Street, North Balwyn and Little Opie Street-  
Ferntree Gully, all in Victoria, Australia

- (g) Recite how appli-  
cant(s) derive(s)  
title from actual  
inventor(s)  
(See headnote\*\*)

are the actual inventor(s) of the invention and the facts upon which the applicant(s)  
is/are entitled to make the application are as follows:

(g) Said inventors made the said invention out of and in the  
course of their employment with applicant and have  
acknowledged applicant's rights to the said invention and  
right to make this patent application and applicant is  
therefore a person entitled under Section 34(1) (fa) of the  
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(Note: Paragraphs 3 and 4 apply only to Convention applications)

- (h) Insert country,  
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for the/for EACH  
basic application

3. The basic application(s) for patent or similar protection on which the application is based  
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(h)

4. The basic application(s) referred to in paragraph 3 hereof was/were the first application(s)  
made in a Convention country in respect of the invention the subject of the application.

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Declared at (i) Melbourne

- (j) Insert DATE of  
signing

Dated (j) 8.9.88

- (m) Signature(s) of  
deklarant(s)

(m) P. Gedfrey

Note: No legalization or  
other witness required

To: The Commissioner of Patents

P18/7/78

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(12) PATENT ABSTRACT (11) Document No. AU-A-18208/88  
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(54) Title  
DEVICE FOR MICROWAVE HEATING

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PHILLIPS, ORMONDE & FITZPATRICK

(57) Claim

1. A device for use in heating foods, comprising a support member and a microwave interactive material capable of converting microwave energy into heat, wherein said support member is a sheet formed of microwave transparent material, and said microwave interactive material extends as a layer over at least a part of a surface of the sheet.

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# COMPLETE SPECIFICATION

(ORIGINAL)

Class

Int. Class

Application Number:

Lodged:

Complete Specification Lodged:

Accepted:

Published:

Priority

Related Art:

APPLICANT'S REF: C.A.P. of 2689

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Complete Specification for the invention entitled:

DEVICE FOR MICROWAVE HEATING

The following statement is a full description of this invention, including the best method of performing it known to applicant(s):

### DEVICE FOR MICROWAVE HEATING

This invention relates to a device for microwave heating or cooking of foods.

It is known to users of microwave ovens that some foods do not cook, or reheat, as well in a microwave oven as they do in a conventional oven. For example, a crisp, brown exterior of pizza or pies reheated or cooked in a conventional oven is difficult to achieve; a pale, soggy exterior being more typical when such foods are reheated or cooked in a microwave oven.

It is an object of the present invention to provide an apparatus which provides improved cooking or reheating of a number of different foods in a microwave oven or the like.

According to the present invention there is provided a device for use in heating foods, comprising a support member and a microwave interactive material capable of converting microwave energy into heat, wherein said support member is a sheet formed of microwave transparent material, and said microwave interactive material extends as a layer over at least a part of a surface of the sheet.

The microwave interactive material capable of converting microwave energy into heat may be of any suitable microwave interactive material. For example, the material may be a film which comprises a base plastics film over which is applied a metallic or metallic oxide coating composition. The microwave interactive material may be laminated, bonded, or otherwise affixed to the support member. The material is preferably in the form of a film glued to the support member, although it may be an integral part of the material of construction of the support member.

The microwave interactive material may be applied in any configuration to a surface of the support member, and may be an unbroken film covering an entire surface, or may be an interrupted film. For example, the film may be stripe-laminated or patch-laminated onto the support member in order to provide preferential heating zones as required by a particular food product.

The material of construction of the support member of the present invention may be any suitable material which is transparent to microwave energy. For example, the material may be paper or paperboard, or may be single or double-faced corrugated material. Preferred forms of the material are discussed later.

The support member may be of any flat shape, such as circular, or rectangular. Preferably, the support member is of a size and shape which enables a food product to be placed thereon, within the periphery of the support member.

2 A food product placed on the support member is able to be heated or cooked on the support member in a microwave oven. The food is heated conventionally by microwave energy, and is also heated by the microwave interactive material. The material absorbs microwave energy impinging thereon, resulting in an increase in its surface energy. The material then acts as a source of heat to brown or crisp the parts of the food product adjacent the material. A food product cooked in this way is both heated by microwave energy, and by conventional conduction or convection heating, via the microwave interactive material.

The microwave interactive material may be provided in any of the ways already mentioned, and its location on the



member at least in part may be dictated by a particular food product. For example, the material may be applied to an entire surface of a support member in the form of a circular sheet for use with a pizza, or may be a thin longitudinal band along the centre of a surface of a rectangular sheet for a pastry or the like.

The support member may include manipulating means by which it is able to be manually manipulated into a desired configuration. Such manipulating means are preferably scored, perforated, or creased lines or the like, which allow folding. Such manipulating means may also allow the detachment of part or parts of the support member as will be further explained. Manipulation of the sheet by use of such perforated lines or the like is advantageous for use of the support member with different types of food. For example, the sale of such support members with manipulating means would allow a user to alter the shape thereof to provide upstanding walls, or to provide legs or the like able to support a food carrying portion thereof above a support surface.

2 The manipulating means may be arranged in conjunction with the microwave interactive material in order to provide preferential heating zones. For example, where means are provided allowing manipulation of the sheet to form upstanding walls, the microwave interactive material may not be provided on those portions of the sheet which form the walls. Further, if a portion of the sheet is to be detached, the material may not be applied to that portion.

In one form, the device of the invention is a rectangular sheet having a number of perforated lines arranged in parallel spaced relationship and extending continuously

across one surface of the sheet. The sheet may be sold separately, and a user may use the sheet by folding along one or more lines, or by tearing along one or more lines, to form a desired shape. Further, the sheet may have lines arranged in two directions, such as two sets of lines arranged perpendicular to each other. Greater scope is then provided for a user to manipulate the sheet to a desired shape, such as to form a tray or sleeve.

In another form, there is provided a rectangular sheet having a respective perforated line adjacent opposed sides, and one further perforated line across the width of the sheet adjacent one or each of its ends. This sheet may be used for a food product such as a sausage roll or the like, by folding a side and at least one end margin upwards to better enclose the food product, and provide browning or crisping over a greater surface area of such food item.

In a preferred form, the sheet of the present invention is capable of being spaced from the basal surface of a microwave oven. Such spacing between the upper surface of the sheet and the basal surface of the microwave oven enables microwave energy generated by the oven to impinge on a food item thereon, from all directions, including from below; while that spacing also generates a heat-box effect ensuring adequate heating of the food item from below.

The spacing may be provided by manipulation of the sheet to form legs or a stand or the like, or may be provided by the material of the sheet itself. In the latter case, the fluted layer of a double or single-faced corrugated material can provide an adequate space between the upper surface of the sheet and the basal surface of the microwave oven to achieve a

heat-box effect. Alternatively, a sheet may be provided with tabs, perforated or scored such that they may be manipulated to form legs for the sheet. Such legs allow the sheet and a food item thereon to be supported above the basal surface of the microwave, and to provide an air-space below the food item.

Thus, in one form, the device comprises a sheet such as of double-faced corrugated material, having a plurality of means adapted to be positioned to provide support legs. A food item can be placed on the sheet after the legs have been manipulated in place, and the assembly can be placed in a microwave oven for heating. The microwave energy will heat the food as a whole, and will cause the microwave interactive material to heat up, thus browning the underside of the food item.

2 In this form, it is preferred that the sheet be provided with an aperture formed in a central region thereof. Such an aperture enables release of water vapour trapped in that region, and further promote browning and crispening in the central region of the underside of the food item. An aperture of this type may be formed, preformed or provided by manipulating tab portions of the sheet.

It should be understood that the device of the present invention may be provided for sale with a food item thereon, pre-packaged within a container. The container may be a carton, or it may be a bag of any type. The sheet with the food item thereon preferably is removed from the container, and placed in a microwave oven for heating. Before being placed in a microwave oven, the sheet may be manipulated to position tabs to provide support legs or to provide an aperture therein, either with or without removing the food

item therefrom.

In order to assist in arriving at an understanding of the present invention, several preferred embodiments are illustrated in the attached drawings. However, it should be understood that the following description is illustrative only and should not be taken in any way as a restriction on the generality of the invention as described above.

In the drawings:

Figure 1 is a plan view of a first embodiment of the present invention;

Figure 2 is a plan view of a second embodiment of the present invention;

Figure 3 is a perspective view of the preferred embodiment of Figure 2 as arranged for heating or working a food item;

Figure 4 is a plan view of a third embodiment of the present invention;

Figure 5 is a perspective view of the embodiment of Figure 4 as arranged for use;

Figure 6 is a plan view of a fourth embodiment of the present invention;

Figure 7 is a perspective view of the fourth embodiment of Figure 6 as arranged for use.

The device 10 of Figure 1 is of rectangular shape with rounded corners. Perforated lines 12 are provided in one direction and at regular spaced intervals along the length of the sheet. In this preferred form the layer of microwave interactive material is not shown, but is understood to be laminated to the sheet, completely covering one side of the sheet.

The device 10 is preferably made of paperboard to provide stiffness for use, but may also be made of a double- or single-faced corrugated material. Sheets in this form may be sold as blanks, without a food item, so that a consumer may use the sheet to cook or heat a desired food item in a microwave oven. The sheet may be manipulated to a desired shape by folding along any of the perforated lines 12, or by tearing along any of the perforated lines 12 to remove a portion. Sheets in this form may also be provided for sale with a food item thereon, and pre-packaged within a further container, such as a carton or a bag or the like.

In Figure 2 there is illustrated a device 14 with a perforated line 16 along each of opposed sides, a perforated line 20 adjacent one end and diagonal perforated lines across each corner at the one end. Microwave interactive material 22 is provided in two stripe-laminated areas. Also shown are circular perforated or scored lines 24 which, when perforated, provide ventilation holes 25 as shown in Figure 3. Sheet 14 can be prepared for use, as shown in Figure 3, by detaching portions 26 along perforated lines 18, folding margins 28, 30 and 32 upwardly along respective perforated lines, to provide a tray member on which a food item can be placed for heating or cooking.

In Figures 4 and 5 there is illustrated two views of a third preferred embodiment, which allows manipulation of the sheet so that support legs are formed to enable the sheet is supported above the basal surface of a microwave oven. A sheet 34 has a layer of microwave interactive material over the whole of the upper surface 36. Tabs 38 are provided by perforated lines (indicated by broken lines) and full-cut

lines (indicated by solid lines). Tabs 38 are able to be folded down to form legs 39 as shown in Figure 5.

Sheet 34 also is provided with a central aperture 40 around which similar tabs 42 are formed. Tabs 42 may also serve as legs to aid in supporting the sheet above the basal surface of a microwave oven. Aperture 40 enables release of water vapour from a food item placed over the central region, thereby facilitating browning or crispening of the underside of the food item during heating or cooking.

Figures 6 and 7 illustrate a fourth preferred embodiment, similar to that illustrated in Figures 4a and 4b, but with a butterfly-lock tab system to provide more stable support legs for the sheet. Sheet 44 provided with a layer 46 of microwave interactive material, has pairs of tabs 48 and 50 which, when folded down, interlock to form a butterfly lock 52. Sheet 44 has an central aperture 40 and associated tabs 42. The tabs 42, 48 and 50 are again formed by perforated, scored or pre-cut lines.

Sheet 34 of Figure 4 and sheet 44 of Figure 6 may be provided with a food item, such as a pizza, thereon. The sheet is manipulated to form the legs, and then the sheet with the pizza thereon is heated in a microwave oven.

The present invention provides a device which may be manipulated to a shape to conform to the cooking or heating requirements of a range of food products in order to be cooked or heated in a microwave oven utilizing the microwave interactive material to selectively brown or crisp the food. The device may be provided with the food, or may be sold separately for individual use. In either case, the device generally is supplied in a flat unfolded form, with

2

manipulating means being able to be positioned or folded as  
required for use:

THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A device for use in heating foods, comprising a support member and a microwave interactive material capable of converting microwave energy into heat, wherein said support member is a sheet formed of microwave transparent material, and said microwave interactive material extends as a layer over at least a part of a surface of the sheet.
2. A device according to claim 1, wherein said sheet includes manipulating means enabling said sheet to be adapted to a desired configuration.
3. A device according to claim 2, wherein said manipulating means comprise perforated lines, pre-cut lines, or scored lines, or a combination thereof.
4. A device according to claim 2 or claim 3, wherein said manipulating means is adapted to form support means integral with the sheet to support said sheet above the basal surface of a microwave oven.
5. A device according to claim 4, wherein said manipulating means includes a plurality of tabs able to be folded to define support legs such that an air space is provided below a food item.
6. A device according to any one of claims 1 to 5, wherein the microwave transparent material is paperboard.
7. A device according to any one of claims 1 to 5, wherein the microwave transparent material is a single- or double-faced corrugated material.
8. A device according to claim 7, wherein said corrugated material is of a thickness and form enabling the sheet to support a food item above the basal surface of a microwave oven.



9. A device according to any one of claims 1 to 8, wherein the microwave interactive material is applied as a continuous layer covering a major part of one surface of the sheet.

10. A device according to any one of claims 1 to 8, wherein the microwave interactive material is applied as a layer to selected regions on one surface of the sheet.

11. A device according to any one of claims 1 to 10 wherein said sheet is enclosed within a container, from which the sheet is removable for heating or cooking a food item thereon.

12. A device according to any one of claims 1 to 11 wherein said sheet further includes at least one preformed aperture in a central region thereof.

13. A device according to claim 1 substantially as herein described with reference to the accompanying drawings.

DATED: 22 June, 1988.

**2**  
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FIG 1

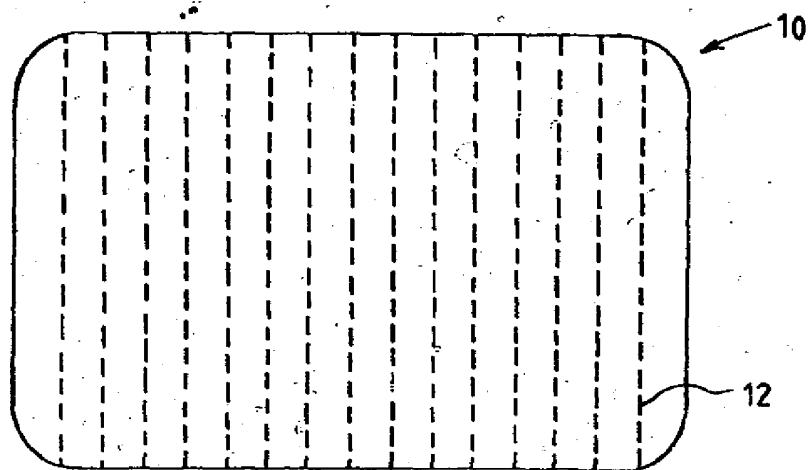


FIG 2

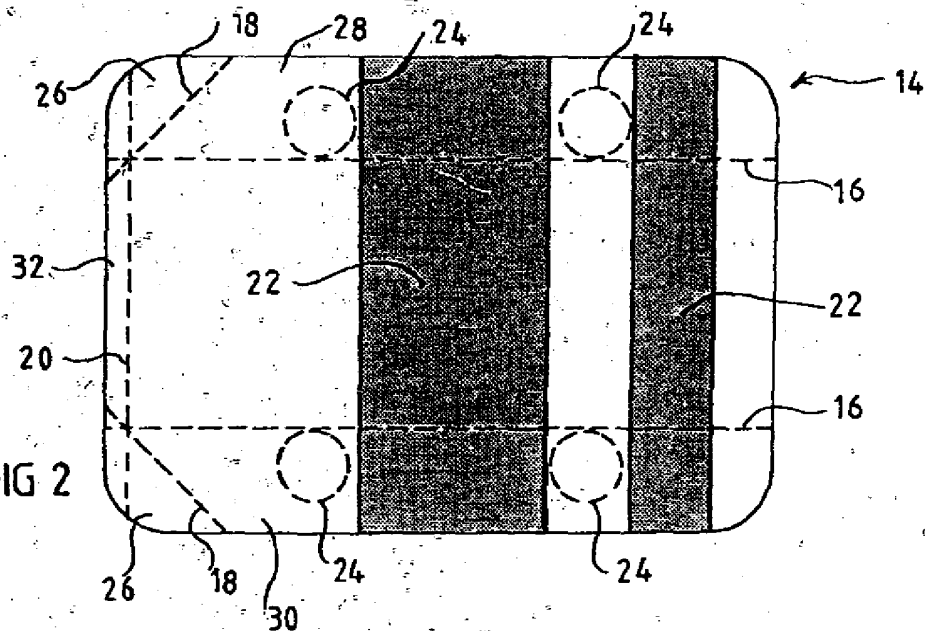


FIG 3

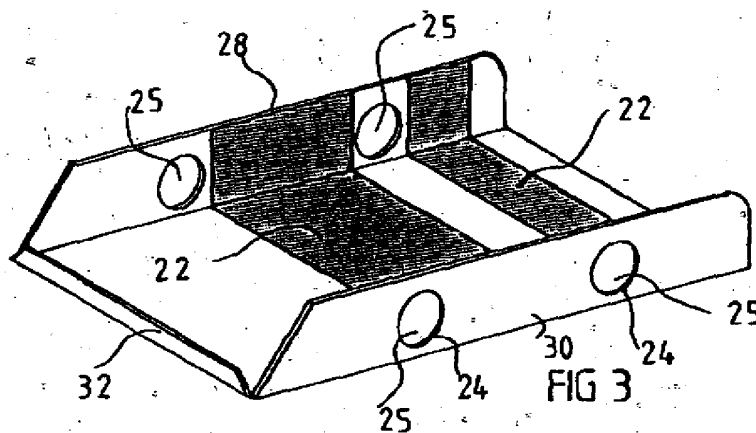


FIG 5

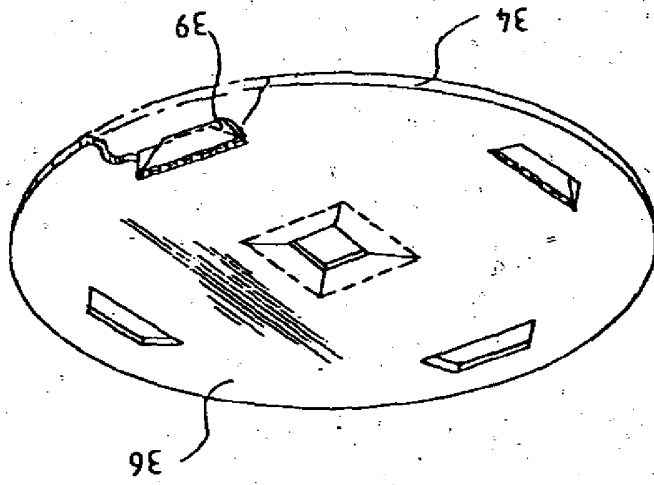
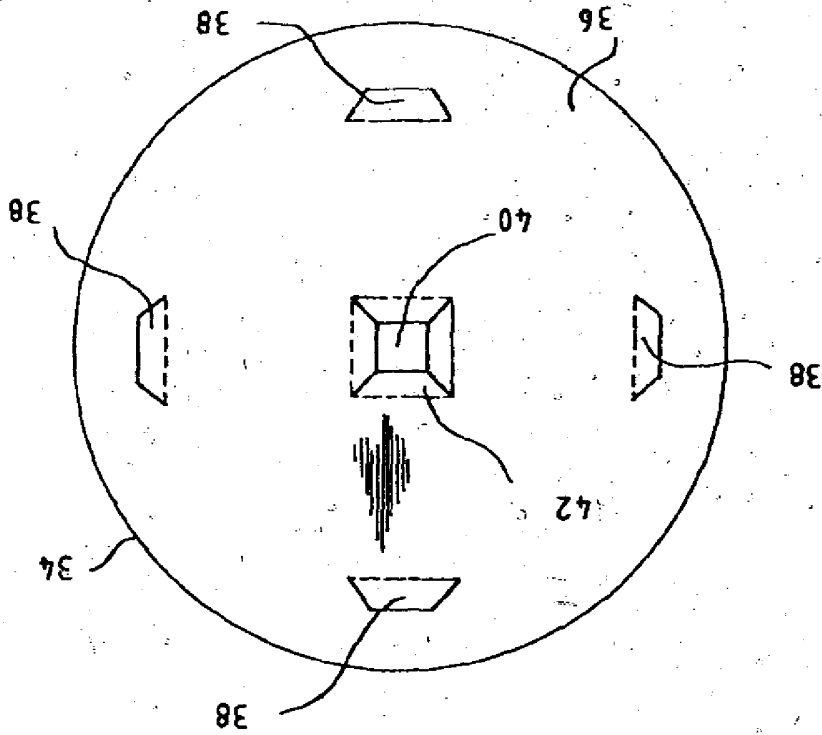


FIG 4



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